NON-PUBLIC?: N
ACCESSION #: 9208050193
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Donald C. Cook Nuclear Plant - Unit 2 PAGE: 1 OF 4

DOCKET NUMBER: 05000316

TITLE: Reactor Trip from Turbine Trip Caused by a Sudden Loss of Main Condenser Vacuum During Diagnostic Testing
EVENT DATE: 07/02/92 LER #: 92-007-00 REPORT DATE: 07/31/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: 1 POWER LEVEL: 8

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: G. A. Tollas - Safety and Assessment Superintendent TELEPHONE: (616) 465-5901

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On July 2, 1992 at 1120 hours, the Unit 2 reactor tripped from a turbine trip coincident with turbine power greater than 10%. Unit 2 was in Mode 1 at 8% thermal power with the main turbine operating at synchronous speed (1800 rpm) and unloaded. Main condenser vacuum was being adjusted using a startup air ejector to investigate a turbine vibration problem. During this evolution, main condenser vacuum decreased at a greater than anticipated rate which resulted in the main turbine control valves opening automatically to maintain 1800 rpm. This caused turbine first stage pressure to increase which enabled the reactor trip from turbine trip logic. When main condenser vacuum decreased to 24.8 in. Hg., the operators manually tripped the turbine in accordance with the loss of condenser vacuum abnormal procedure. An automatic reactor trip from turbine trip immediately followed.

All automatic protection responses, including reactor trip and its associated actuations were verified to have functioned properly as a result of the reactor trip signal. Unit 2 was stabilized in Hot Standby (Mode 3) at 1128 hours on July 2, 1992. Procedure enhancements have been made and Operator training will be conducted as a result of this event.

END OF ABSTRACT

Conditions Prior to Occurrence

Unit 2 - 8 percent Reactor Thermal Power

Description of Event

On July 2, 1992 at 1120 hours, the Unit 2 reactor (EIIS/JE) tripped from a turbine trip coincident with turbine power being greater than 10%. Prior to the reactor trip, Unit 2 was in Mode 1 at 8% thermal power. The main turbine (EIIS/TA-TRB) was running at synchronous speed (1800 rpm), and unloaded, to investigate a high turbine vibration problem. As part of the investigation, the turbine engineer requested that the main condenser (EIIS/SG-COND) vacuum be adjusted from 28.5 to 25.5 in. Hg to evaluate the effect of the reduced vacuum on turbine vibration. Plant management reviewed the request and determined that adjusting main condenser vacuum to approximately 26 in. Hg. using the startup air ejectors (SAE) (EIIS/SH-EJR) could be conducted within existing procedure network, and that a special procedure was not required as the unit was not being taken outside its normal operating limits. The contingency plan for this evolution was determined to be within the bounds of the abnormal procedure. The maximum achievable vacuum using the SAE is about 26 in. Hg.

Prior to the evolution, the Operations Department Shift Supervisor conducted a job brief with all involved control room operators to discuss the vacuum reduction including limits provided in normal and abnormal procedures. During the briefing, the operators reviewed the temperature transient on the Reactor Coolant System (RCS) which had occurred during a previous reduction in vacuum to evaluate the turbine vibration. Considering the RCS temperature transient, the operators decided to isolate the air offtakes to two SAE's and throttle the steam to the remaining SAE. When the SAE was valved in to reduce vacuum, a faster than expected drop in vacuum was experienced. As vacuum dropped, the main turbine control valves (EIIS/TA-FCV) opened automatically to maintain 1800 rpm. This caused first stage pressure to increase to near the P-13 setpoint. P-13 enables a reactor trip from turbine trip. The

turbine was manually tripped at 24.8 in. Hg. per the abnormal loss of vacuum procedure. An automatic reactor trip from turbine trip immediately followed due to the first stage pressure increase from the turbine trip which enabled P-13. A sequence of events report showed that the P-13 setpoint was reached 40 milliseconds after the manual turbine trip.

Description of Event (Continued)

Operations personnel immediately implemented Emergency Operating Procedure 2 OHP 4023.E-0 to verify proper response of the Automatic Protection System and to assess plant conditions for appropriate recovery actions.

When the reactor coolant system (RCS) reached approximately 533 degrees Fahrenheit, all four main steam isolation valves (EIIS/SB-ISV) were manually tripped closed to terminate the RCS cooldown in progress following the reactor trip. At the time of the reactor trip, Unit 2 was supplying the plant's auxiliary steam loads. There was relatively little decay heat because of the low power history on the recently refueled reactor. As such, the cooldown experienced was not unexpected.

Cause of Event

The cause of this event was throttling the SAE steam supply valve to minimize auxiliary steam load and prevent excessive RCS cooldown. Under the existing plant conditions, this resulted in insufficient steam supply pressure to the SAE and the subsequent rapid drop in condenser vacuum when the SAE air off-take valve from the condenser was opened.

Analysis of Event

This report is being submitted in accordance with 10CFR50.73, paragraph (a)(2)(iv), as an event that resulted in an unplanned automatic actuation of the Engineered Safety Features, including the Reactor Protection System.

All automatic protection responses, including reactor trip and its associated actuations were verified to have functioned properly as a result of the reactor trip signal. Based on the above, it is concluded that the event did not constitute an unreviewed safety question as defined in 10CFR50.5
(a)(2) nor did it adversely impact the health and
safety of the public.

Corrective Actions

As a result of the operating experience from this event, enhancements have been made to the normal operating procedure. In addition, lessons learned will be incorporated into future Operator training.

Previous Similar Events

LER 50-315/89-001-00

Indiana Michigan
Power Company
Cook Nuclear Plant
One Cook Place
Bridgman, MI 49106 AEP
616 465 5901 INDIANA
MICHIGAN
POWER

July 31, 1992

United States Nuclear Regulatory Commission
Document Control Desk
Rockville, Maryland 20852

Operating Licenses DPR-74
Docket No. 50-316

Document Control Manager:

In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted: 92-007-00

Sincerely,

A. A. Blind
Plant Manager

/sb

Attachment

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